being the case, the question must at least be raised whether the demand for water and nutrients is greater or less in the older than in the younger vein islets. It seems not impossible that the decreasing metabolic activity with advancing age in the vascular tissues themselves may be a factor in determining the increase in the veinlets. The reviewer has shown that the spatial relations of successively arising parts may vary directly with the metabolic rate, and it is perhaps allowable to suggest that in this case the more frequent branching of the veinlets in the older leaves may be to some extent associated with a lower metabolic rate in each new branch, and consequently a lower limit of distance within which it inhibits the development of new veinlets.

In conclusion, it must be noted that BENEDICT'S use of the terms "senile" and "senility" is at least unusual. These terms are commonly used only with reference to the extreme stage of senescence preceding death in man and the higher animals, where actual atrophy, degeneration, and necrosis of cells occur, but BENEDICT speaks of senile changes occurring in the early stages of development. To substitute "senile" and "senility" for "aging" and "senescence" is simply to give the former terms a new meaning. To speak of meristematic tissue or of a plant in "vigorous maturity" as senile is to a zoologist or animal physiologist little less than a contradiction in terms. Moreover, the increase in vascular tissue in the leaf with advancing age of the plant is scarcely comparable to the replacement of atrophied organs by connective tissue in man and the higher animals, but resembles rather the increase in stable morphological structure which occurs during development in animals. Criticism of such points, however, does not detract from the interest and significance of BENEDICT'S evidence for the occurrence of a gradual, progressive change, slight, but apparently in the direction of senescence, in the meristematic tissues during vegetative life.—C. M. CHILD.

Cecidiology.—American botanists will be interested in a posthumous paper on American insect galls by THOMPSON.[2] In part I, the galls are classified under the generic names of the host plants, with subordinate grouping based on the host plant. The descriptions are very brief, in most cases restricted to a single line, but give the specific names of the host plants and statements as to anatomy. This first part will prove very useful to botanists. Part II groups the galls with reference to the insects causing them and gives a list of host plants for each. This part also includes a bibliography and a lengthy supplemental list which includes a few fungus galls. The illustrations are good and the entire publication will prove very helpful.

American botanists will also be interested in a paper by STEWART[3] on the anatomy of *Gymnosporangium* galls. This paper is summarized as follows:

[2] THOMPSON, M. T., An illustrated catalogue of American insect galls. pp. 66. *pls. 21.* 1915. Edited by Dr. E. P. FELT.

[3] STEWART, ALBAN, An anatomical study of *Gymnosporangium* galls. Amer. Jour. Bot. 2:402–417. 1915.

"*Gymnosporangium juniperi-virginianae* and *G. globosum* cause the formation of large galls on the younger branches of *Juniperus virginiana*. The galls arise from the axils of the leaves and are evidently transformed axillary buds. Young galls have two distinct fibrovascular systems, one of which is a leaf trace bundle, and the other a stem. The more or less modified stem which enters the base of the older galls gradually breaks up and radiates outward, deeper in the gall tissue. Leaf tissue is also involved in gall formation, and remains of it are usually to be found adhering to the older galls. Normal stems sometimes appear to have grown out from the surface of the older galls. Accessory stem structures occur, which probably originate by a branching of the main stem in the gall. Broad, raylike masses of parenchyma, surrounded by tracheids, are of rather common occurrence. Irregularly twisted masses of fibrovascular tissue occur which are similar in many respects to like structures in traumatic wood. Cells which are transitional between parenchyma and tracheids are quite abundant. The irregularly running bundles in the gall are composed largely of scalariform tracheids."

Another very interesting contribution to our American literature is by PING[4] on the well known and very conspicuous round gall of the golden rod. This paper is more entomological than botanical, but contains much that is interesting to the botanist. The author describes the gall which is restricted to *Solidago canadensis* and caused by the larva of *Eurosta solidaginis* Fitch. The adult insects emerge in May, deposit their eggs on the surface of the growing plant, where they hatch in a short time, and the larva immediately penetrates the host. The author gives the life history of the insect, which extends throughout the following winter, and also gives the life history of the beetle (*Mordellistina unicolor* Lec.) which inhabits the gall, and a list of other insects found associated with the gall. It may be too much to expect the entomologist to give a discussion of the histology and development of the gall, but in connection with the study of the larva, it would certainly have added much to the paper if the author had given some attention to the host tissues to which the stimulation was applied.

An interesting paper is one by COBB[5] on a nematode disease of sugar cane and banana. The author calls attention to the outbreaks in Fiji, Hawaii, and Jamaica, describing the symptoms of the disease and the causal organism.

Another very valuable paper is by FELT,[6] who has made extensive studies of the gall midges in recent years. Although this paper is primarily entomological, it contains descriptions of many galls, some of which are rather difficult to classify.

---

[4] CHI PING, Some inhabitants of the round gall of the golden rod. Jour. Ent. and Zool. **7**:161–179. 1915.

[5] COBB, N. A., *Tylenchus similis*, the cause of a foot disease of sugar cane and banana. Jour. Agric. Research **4**:561–568. 1915.

[6] FELT, E. P., A study of gall midges, III. 30th Report State Entomol. New York. Museum Bull. **180**:127–288. 1916.

Among the important foreign contributions is a paper by WADSWORTH[7] on the knapweed gall. This gall is most common on *Centaurea nigra* L., a very troublesome pasture weed, but also occurs *C. scabiosa* L., *C. montana* L., *C. paniculata* L., *Carduus nutans* L., *C. crispus* L., *C. anthoides* L., *Cirsium lanceolatum* L., *Serratula tinctoria* L., etc. The gall is caused by a dipterous insect which was originally described in 1758. The adults emerge during a period of about two weeks in June and deposit eggs on the young flower heads early in July. The author gives synonomy, historical discussion, description, life history, and distribution of the insect. The effect of this falling is to reduce the seed production to about 50 per cent. Of the seeds that are produced only 60.5 per cent germinate.—MEL. T. COOK.

Australian vegetation.—In a country of vast extent and consequent widely differing conditions it is difficult to gain any accurate concept of the most striking characters of the vegetation or of the principal affinities of the flora. Such a characterization was prepared by MAIDEN[8] in connection with the recent visit of the British Association to Australia. In reviewing the main natural divisions of the country he calls attention to the "geocols," broad depressed areas running east and west and separating wide plateaus, and to their possible influence upon plant distribution. Interesting botanical statistics show among other things that one family, the Leguminosae, is represented by 1275 species, while the Myrtaceae, Proteaceae, and Compositae show over 500 species each. Among remarkable prominent genera are *Acacia* with 412 species, and *Eucalyptus* with 230 species. Incidentally it would seem that the largest specimens of the latter of which authentic measurements exist are about 326 ft. in height and 25 ft. 7 in. in circumference, 6 ft. from the ground, dimensions excelled by the sequoias of America.

Some attention is given to introduced plants, many of which are of vast importance in the weed problems of the agricultural areas. The most remarkable instance cited is that of the prickly pear, *Opuntia inermis*, introduced from Rio de Janeiro in 1789 as food for the cochineal insect, which is now badly infesting an area of 30,000,000 acres, to which about 1,000,000 acres are being added annually by its natural increase.

The flora is analyzed rather effectively and its various affinities demonstrated. Finally, concise sketches are given of the flora and vegetational types of the various individual states. It is impossible to summarize these already condensed characterizations, but it may be of interest to note the attention directed to Victoria, the most carefully studied areas of which are

[7] WADSWORTH, J. T., Some observations on the life history and bionomics of the knapweed gall fly *Urophora soltitiallii* Linn. Annals Appl. Biol. 1:142–169. 1914.

[8] MAIDEN, J. H., Australian vegetation. Federal handbook on Australia. pp. 163–209. 1914. Issued in connection with the visit of the British Association for the Advancement of Science to Australia. 1914.